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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,677

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Christine Terreau

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EXAMINER

MOWLA, GOLAM

ART UNIT

PAPER NUMBER

1723

MAIL DATE

DELIVERY MODE

08/02/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,677	Applicant(s) TERREAU ET AL.	
	Examiner GOLAM MOWLA	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4,6,8,12-18,20-22,24-27,31-36 and 38-40 is/are pending in the application.
- 4a) Of the above claim(s) 18,20-22,24-27,35 and 40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4,6,8,12-17,31-34,36,38 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/14/2011</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/14/2011 has been entered.

Response to Amendment

2. In response to Office Action dated 10/14/2010, Applicant submitted an amendment on 04/14/2011. However, the amendment does not place the Application in condition for allowance.

3. Claims 2-4, 6, 8, 12-18, 20-22, 24-27, 31-36 and 38-40 are currently pending. Applicant has amended claims 18 and 36, and cancelled claims 1, 5, 7, 9-11, 19, 23, 28-30 and 37. Claims 18, 20-22, 24-27, 35 and 40 are withdrawn from consideration as being part of non-elected invention.

Status of the Objections or Rejections

4. The objections to the Specification is still maintained because claim 39 contains subject matter which was not described in the specification in such a way as to reasonably convey to one

Art Unit: 1723

skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention

5. Due to Applicant's amendment to claim 36, the prior art rejection of all pending claims from the office Action dated 10/14/2010 is withdrawn. However, upon further consideration, a new ground of rejection is presented below.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 39 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 39 recites the limitation "... free of ethylene-vinyl acetate (EVA) copolymer" in lines 1-2, which is not supported by the original disclosure as filed. There is no disclosure of "... free of ethylene-vinyl acetate (EVA) copolymer" being specifically contemplated in the specification as originally filed. Applicant contends that paragraphs [0011-0014] and [0041] of the original disclosure describes replacement and thus elimination of EVA. However, the above mentioned paragraphs only show the use of EVA increases the manufacturing cost. It does not specifically contemplate complete elimination of EVA in order to make the solar cell module "free of ethylene-vinyl acetate (EVA) copolymer."

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 2-4, 6, 8, 12-17, 31-34, 36 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka et al. (US 6,175,075) in view of Stein (US 5,569,689).

Regarding claims 6, 12 and 36, Shiotsuka discloses a solar cell module (see fig. 1b and 12:33-54) comprising a rigid or flexible superstrate (protective film 123) (18:1-49), a silicone adhesive (surface side filler resin 122 which comprises silicone) (15:55-16:10), and one or more solar cells (photovoltaic element string 121 having a plurality of photovoltaic elements) (9:46-47) disposed on said silicone adhesive (122). Although Shiotsuka discloses that it is preferable to use EVA for the surface side filler resin (122), it is noted a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments (*Merck & Co v. Biocraft Labs.*, 874 F.2d 804, 807 (Fed. Cir. 1989)), and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments (*In re Susi*, 440 F.2d 442, 446 n.3 (CCPA 1971)) (MPEP §2123 II). Thus, one skilled in the solar or photovoltaic art realizes that the silicone adhesive as taught by Shiotsuka (15:55-16:10) can also be used for the surface side filler resin (122).

Shiotsuka further teaches that the silicone adhesive (122) is utilized in order provide adhesion between the superstrate (123) and the solar cell (121). However, the reference is silent as to whether the silicone adhesive (122) has a viscosity of from 100-2000 mPa.s at 25°C and comprises a composition that is formed from: (Ai) 100 parts by weight of a first liquid

Art Unit: 1723

diorganopolysiloxane having at least two Si-alkenyl groups per molecule, (Bi) 20 to 40 parts by weight of a first silicone resin containing at least two alkenyl groups, (Ci) a first cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (Ai) is $<1:1$, and (Di) a first hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (Ai).

Stein teaches a silicone adhesive composition having improved adhesivity (1:22-33 and 2:23-33). Stein further teaches that a composition that is formed from: (Ai) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule (2:55-60), (Bi) up to 100 parts by weight of a silicone resin containing at least two alkenyl groups (3:4-14), (Ci) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (Ai) is from 0.4:1 to 2:1 (3:15-45), and (Di) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (Ai) (3:56-4:10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the silicone adhesive composition of Stein in the solar cell module of Shiotsuka in order to allow for sufficient adhesion between the superstrate (123) and the solar cell (121).

Art Unit: 1723

The claimed ranges of the first silicone resin and the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (Ai) overlap or lies within the disclosed range. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (MPEP § 2144.05, *In re Wertheim*). In an alternative, it would have been obvious to one of ordinary skill in the art at the time of the invention to have performed routine experimentation to determine the optimum weight fraction of the first silicone resin, and the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (Ai) by routine experimentation such that the adhesivity of the silicone adhesive composition is optimized. In the case where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (MPEP § 2144.05 IIA, *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Since the silicone adhesive composition of Shiotsuka in view of Stein as modified has the same composition as the instant claim, the silicone adhesive composition of Shiotsuka in view of Stein as modified must inherently have a viscosity of from 100-2000 mPa.s at 25°C before curing. If different results are achieved, it must be due to the limitations that are not currently claimed. It is also noted that claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable (*In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977)) (MPEP §2112).

Shiotsuka further discloses a silicone encapsulant (back side filler resin 124) (19:20-22) disposed on said one or more solar cells (121). Shiotsuka further teaches that the silicone

Art Unit: 1723

encapsulant (124) is utilized in order provide adhesion between the substrate (126) and the solar cell (121). Although Shiotsuka discloses that it is preferable to use EVA for the back side filler resin (124), it is noted a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments (*Merck & Co v. Biocraft Labs.*, 874 F.2d 804, 807 (Fed. Cir. 1989)), and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments (*In re Susi*, 440 F.2d 442, 446 n.3 (CCPA 1971)) (MPEP §2123 II). Thus, one skilled in the solar or photovoltaic art realizes that the silicone encapsulant as taught by Shiotsuka (15:55-16:10 and 19:20-22) can also be used for the back side filler resin (124).

However, Shiotsuka is also silent as to whether the silicone encapsulant (124) comprises a liquid silicone encapsulant composition that is formed from: (A) 100 parts by weight of a second liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule, (B) 20 to 40 parts by weight of a second silicone resin containing at least two alkenyl groups, (C) a second cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (A) is > 1:1 to 5:1, and (D) a second hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (A).

Stein teaches a silicone encapsulant composition having improved adhesivity (1:22-33 and 2:23-33). Stein further teaches that a composition that is formed from: (A) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule

Art Unit: 1723

(2:55-60), (Bi) up to 100 parts by weight of a silicone resin containing at least two alkenyl groups (3:4-14), (Ci) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (Ai) is from 0.4:1 to 2:1 (3:15-45), and (Di) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (Ai) (3:56-4:10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the silicone encapsulant composition of Stein in the solar cell module of Shiotsuka in order to allow for sufficient adhesion between the substrate (126) and the solar cell (121).

The claimed ranges of the second silicone resin and the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (A) overlap or lies within the disclosed range. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (MPEP § 2144.05, *In re Wertheim*). In an alternative, it would have been obvious to one of ordinary skill in the art at the time of the invention to have performed routine experimentation to determine the optimum weight fraction of the second silicone resin, and the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (A) by routine experimentation such that the adhesivity of the silicone encapsulant composition is optimized. In the case where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by

Art Unit: 1723

routine experimentation (MPEP § 2144.05 IIA, *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Regarding claims 2-4 and 31, the reference further discloses that said one or more solar cells (121) is either a wafer or a thin film made from a amorphous silicon, polycrystalline silicon, gallium arsenide, copper indium diselenide or cadmium telluride (13:45-57).

Regarding claim 14, Shiotsuka in view of Stein further discloses the first and second silicon resins contain up to 100 parts weight. Although the reference is silent as to whether said liquid silicone encapsulant composition comprises a resin fraction of between 30% and 50% by weight and said silicone adhesive composition comprises a resin fraction of between 20% and 30% by weight, it would have been obvious to one of ordinary skill in the art at the time of the invention to have performed routine experimentation to determine the optimum weight fraction of the second silicone resin such that the adhesivity of the silicone encapsulant composition is optimized. In the case where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (MPEP § 2144.05 IIA, *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Regarding claims 15-16, 32-33 and 38, the silicone adhesive/encapsulant composition of Shiotsuka in view of Stein as modified has the same composition as the instant claim, and therefore, the silicone encapsulant/adhesive composition of Shiotsuka in view of Stein as modified must inherently cure without releasing volatiles and exhibits a light transmission substantially equivalent to glass. If different results are achieved, it must be due to the limitations that are not currently claimed. It is also noted that claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily

Art Unit: 1723

make the claim patentable (*In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977)) (MPEP §2112).

Regarding claims 8, 13, 17 and 34, Shiotsuka in view of Stein further discloses one or more solar cells (121) is pre-treated prior to adhesion to the silicone encapsulant/adhesive composition (since the photovoltaic string is already made and interposed between silicone encapsulant and silicone adhesive, it must be pre-made/treated), and the silicone encapsulant/adhesive composition additionally comprises one or more adhesive promoter(s) and/or an anti-soiling agent(s) and/or cure inhibitor (s) and/or a silane of the formula $(R^1O)^3SiR^2$, wherein R^1 is an alkyl group comprising 1 to 6 carbon atoms, R^2 is selected from the group of an alkoxy group comprising 1 to 6 carbon atoms, an alkyl group comprising 1 to 6 carbon atoms, an alkenyl group comprising 1 to 6 carbon atoms, an acrylic group or an alkyl acrylic group (1:58-67).

Regarding claim 39, the combination further discloses the solar cell module is free of EVA (see discussion above).

Response to Arguments

10. Applicant's arguments filed on 04/14/2011 have been fully considered but they are not persuasive.

With respect to the new matter rejection of claim 39, on pages 17 and 18 of Remarks Applicant argues that paragraphs [0013] and [0014] of the original disclosure describes the EVA is replaced by liquid encapsulant and therefore, the solar cell is free of EVA.

Art Unit: 1723

The examiner respectfully disagrees. The above mentioned paragraphs only show the use of EVA increases the manufacturing cost. It does not specifically contemplate complete elimination of EVA in order to make the solar cell module “free of ethylene-vinyl acetate (EVA) copolymer.”

On pages 18 and 19 of Remarks, Applicant argues that Shiotsuka focuses on use of hot-melt resin materials such as EVA, EMA, EEA, etc. in solar cells, and therefore one skilled in the art would not modify Shiotsuka to use silicone resin material for the adhesive and/or encapsulant.

The examiner respectfully disagrees. Contrary to the Applicant's contention, Shiotsuka explicitly discloses that the silicone adhesive can be used for the surface side filler resin (122) (15:55-16:10) and also for the silicone encapsulant (back side filler resin 124) (19:20-22 and 15:55-16:10). Although Shiotsuka discloses that it is preferable to use EVA for the surface side filler resin (122) or for the back side filler resin (124) (19:20-22), it is noted a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments (*Merck & Co v. Biocraft Labs.*, 874 F.2d 804, 807 (Fed. Cir. 1989)), and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments (*In re Susi*, 440 F.2d 442, 446 n.3 (CCPA 1971)) (MPEP §2123 II). Thus, one skilled in the solar or photovoltaic art realizes that the silicone adhesive as taught by Shiotsuka (15:55-16:10) can also be used for the surface side filler resin (122) (15:55-16:10) and also for the silicone encapsulant (back side filler resin 124) (19:20-22 and 15:55-16:10).

Art Unit: 1723

With respect to applicant's argument regarding unexpected results, it is noted that Stein explicitly teaches a silicone adhesive or encapsulant composition having improved adhesivity (1:22-33 and 2:23-33) and therefore "expected beneficial results are evidence of obviousness of a claimed invention, just as unexpected results are evidence of unobviousness thereof" (*In re Gershon*, 372 F.2d 535, 538, 152 USPQ 602, 604 (CCPA 1967)) (MPEP §716.02 (c) (II)).

Examiner further notes that each of the examples compares a solar cell module having silicon adhesive and/or encapsulant to a solar cell module having EVA adhesive and/or encapsulant. In order to show unexpected result of the solar cell module having claimed silicon adhesive and encapsulant composition, Applicant must provide evidence showing that the claimed composition having each of the components (Ai, Bi, Ci, Di, A, B, C and D) within the claimed range provide superior results as opposed to a solar cell module having silicone composition having each of the components (Ai, Bi, Ci, Di, A, B, C and D) outside (above and below) the claimed range.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-Th, 0800-1830 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1723

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./

Examiner, Art Unit 1723

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1723